

(19)



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(11)

EP 0 823 388 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
11.02.1998 Bulletin 1998/07

(51) Int Cl.⁶: B65D 81/34, B65D 75/00

(21) Application number: 97305847.2

(22) Date of filing: 01.08.1997

(84) Designated Contracting States:
AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE
Designated Extension States:
AL LT LV RO SI

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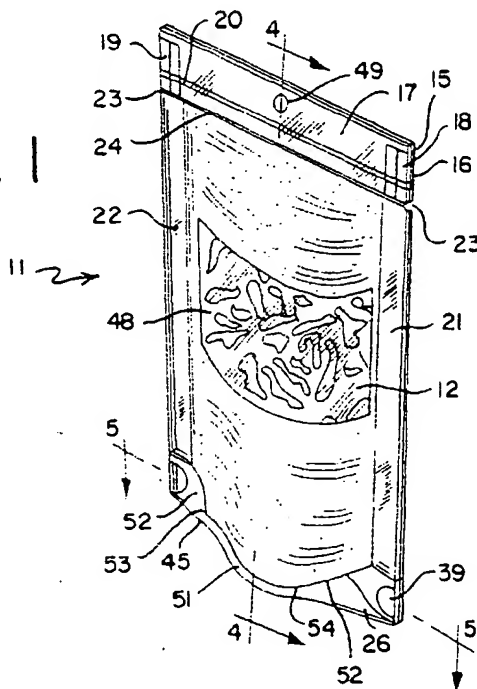
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(54) Refrigerated, microwaveable food entree in stand-up pouch

(57) The combination of a refrigerated microwaveable food entree (12) and stand-up pouch (11) is provided. The pouch of the combination is a flexible pouch (11) which has a foldable bottom panel (33) which defines an expanded configuration or an unexpanded closed configuration of the pouch (11) depending upon the extent that the unsealed portion (36, 37) of the bottom panel (33) is folded. The pouch (11) also includes areas (18,

19) by which the pouch can be safely grasped by the user even after the combination has been heated to eating temperatures, typically within a microwave oven. A method for providing a hot food entree (12) is also described, the entree (12) being a heated food component which had been pasteurized and refrigerated prior to heating for consumption. The hot food entree (12) includes protein sources, particularly meats and the like, typically within a sauce.

FIG. 1



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Description

Background and Summary of the Invention

The present invention generally relates to the combination of an upstanding pouch and a food entree sealed therewithin, as well as a method of providing a hot food entree. More particularly, the invention relates to the combination of an upstanding flexible pouch and a food entree contained therein, which flexible pouch is able to stand upright on its own during microwave heating and the like, the food entree being of the type which is pasteurized within the pouch and which is then refrigerated until same is heated, opened and served.

Packages having food components sealed therewithin until subjected to microwave heating are generally known. Typically, these products are not refrigerated types of products. Examples in this regard include popcorn or other food items which do not exhibit qualities requiring or permitting refrigeration. Such products can tend to be more in the nature of shelf-stable items or frozen items. Generally, foods which are subjected to retort conditions or the freezing process do not maintain taste, texture and appearance qualities when compared with products which are not subjected to harsher conditions such as high temperature processing or freezing. Accordingly, there is a need for a combination wherein a refrigerated food entree can be packaged and distributed as a refrigerated product which is microwaveable for heating to a serving temperature.

One difficulty that is often encountered with packaged microwaveable products is a concern over burning or making uncomfortably hot the fingers of the person opening the packaging. This is due to the relative simplicity of microwaveable packages which are typically disposable and thus not readily amenable to extra packaging details that would add to the expense, complexity and wastefulness of the packaging. Accordingly, there is a need for food entree microwaveable packaging which can go from refrigeration to microwave heating without requiring sophisticated, multi-component packages to help alleviate concerns of high temperatures contacting the fingers or digits of the user during opening of the packaging.

In summary, the present invention provides a refrigerated food entree sealed within an upstanding pouch which has features that allow the user to open the pouch and pour the heated food entree out of the pouch after suitable microwave warming by providing areas of the sealed pouch surfaces that serve as handle areas spaced adequately from the heated entree so as to reduce heat transfer to acceptable levels at the areas at which the pouch is grasped during opening and pouring. The food entree is of the type that is pasteurized within the sealed pouch and then refrigerated until desired microwave warming. The invention also encompasses a method for providing a hot food entree by sealing same in a flexible pouch, pasteurizing same, refrigerating dur-

ing storage, distribution, in-store display and home storage, heating same within a microwave oven and emptying the contents in a safe and efficient manner.

It is accordingly a general object of the present invention to provide an improved refrigerated, microwaveable food entree sealed within a disposable pouch.

Another object of the present invention is to provide an improved refrigerated, microwaveable food entree and pouch which will stand erect on its own during microwaving, along with an accompanying method.

Another object of the present invention is to provide an improved food entree and pouch combination and method intended for use within a microwave oven while providing non-wasteful packaging that provides safe grasping locations for opening the heated pouch and for emptying the heated food entree from the pouch.

These and other objects, features and advantages of the invention will become apparent from and clearly understood through the further and more detailed description of the invention which follows.

Brief Description of the Drawings

In the course of the description, reference will be made to the attached drawings providing further details of a preferred and exemplified embodiment of the present invention.

FIG. 1 is a perspective view of a preferred embodiment of a pouch and food entree combination in accordance with the invention, shown in an expanded and upstanding orientation;

FIG. 2 is an illustration of a typical procedure for opening a pouch of the type illustrated in FIG. 1;

FIG. 3 illustrates the opened pouch of FIG. 2 from which the heated food entree is being poured;

FIG. 4 is a vertical cross-sectional view along the line 4-4 of FIG. 1;

FIG. 5 is a horizontal cross-sectional view along the line 5-5 of FIG. 1;

FIG. 6 is a partial cross-sectional view similar to that of FIG. 4 but at an off-center location; and

FIG. 7 is a partial cross-sectional view similar to that of FIG. 4 but with the pouch bottom in an unexpanded orientation.

Detailed Description of the Invention

A fully closed pouch is generally designated at 11 in FIG. 1. A food entree 12 is sealed therewithin, and the pouch bottom is expanded. It will be noted that, in this preferred embodiment, the pouch 11 is of the stand-up or upstanding type wherein the pouch is in a vertical orientation and remains so oriented by virtue of the structure of the pouch and its combination with the food entree sealed therewithin when the bottom portion of the pouch is expanded as shown.

Pouch 11 includes two side panels 13 and 14 (FIG.

4) sealed together along top and side edge portions. More particularly, top edge portion 15 of side panel 13 is fused or sealed to top edge portion 16 of side panel 14 in order to form a top seal 17, typically by heat sealing together the entirety of the top edge portions 15 and 16. A so-called chisel seal 20 is also included so as to form a "seal within a seal" or a double seal of the pouch.

More specifically, the chisel seal 20 is usually first made and is spaced from the top edge of the package as shown, this seal being relatively narrow, for example about 1/8 inch or 3 mm. Then the top seal 17 is made over the chisel seal so as to generally enclose the chisel seal within the top seal as can be seen in FIG. 1. This combination of seals has been found to be important in withstanding heating during pasteurization of the pouch and its contents. Otherwise, leaking of some pouches can develop during pasteurization.

Side panels 13 and 14 are also fusion sealed together along both side edge areas of both panels in order to form side seals 21 and 22. Preferably, side seals 21 and 22 include one or more areas 18, 19 which are especially suitable for grasping the pouch. These areas provide a preferred location at which to grasp the pouch top area with one hand, while the other hand grasps an area of the pouch immediately therebelow, as generally shown in FIG. 2. As is evident from FIG. 2, it is one of these side seals which is grasped, together with one of the grasping areas 18, 19 during the course of opening the pouch 11. It is preferred to provide a slit or notch 23 in order to facilitate initiation of the opening procedure. A line of weakening 24 may also be provided in order to ensure even and effective opening to a condition such as that illustrated in FIG. 2.

Once thus opened, the food entree 12 is readily poured out of the mouth 25 which is defined between severed edges of the respective side panels 13 and 14. It will be noted from FIG. 3 that the user is able to grasp a bottom portion of the opened pouch 11 without requiring contact of the fingers or digits with the area of the pouch within which the heated food entree is contained. Instead, the fingers or digits grasp an end of a handle projection 26 which is defined in greater detail herein.

With more particular reference to the handle projection 26, it typically will be composed of at least four layers of the polymer sheeting used in making the pouch. Each polymer sheeting may be itself a laminate or co-extrusion of from two to several layers. These four polymer sheetings are the bottom portion 31 of the side panel 13, the bottom portion 32 of the side panel 14, and two portions of a bottom panel 33.

When the package is in its upstanding and bottom-expanded configuration as illustrated in FIG. 1 and FIG. 4, the wall of the handle projection 26 will vary in depth, as can be generally seen in FIGS. 1, 2 and 3. The central cross-section of FIG. 4 illustrates the shortest depth of this handle projection at the stand-up orientation. This depth should be at least 1/8 inch (about 0.3 cm) to achieve a good stand-up function. At this shortest-depth

location along the handle projection 26, bottom portion 31 is sealed to a central portion 34 of the bottom panel 33, while bottom portion 32 is sealed to another central portion 35 of the bottom panel 33. This forms a lip 51 on both sides of the pouch along a portion of its bottom edge. It will be appreciated that, with the illustrated configuration of the handle projection 26, the seal area between the side panels and the bottom panel increases in depth along diagonal seal interfaces 52. Diagonals 52 are in opposing directions away from the lips 51 and the central portions 34, 35 of the bottom panel 33. This is generally illustrated in FIG. 6, which is a cross-section taken between the central portions 34, 35 and the side seals 21, 22.

As thus illustrated, the seal area between the side panels 13, 14 and the bottom panel 33 is deeper in FIG. 6 than in FIG. 4. This seal area is between side panel bottom portion 31 and an intermediate portion 36 of the shaped sealed area. This sealed area is also between side panel bottom portion 32 and an intermediate portion 37 of the bottom panel 33. It will thus be appreciated that, as one moves outwardly, the depth of the seal area and thus of the handle projection 26 increases, with the maximum grasping area being at corner portions 38 and 39. Accordingly, the handle projection 26 is defined by a seal which has narrowed seal lips 51 that are flanked by and joined at much deeper sealed corner portions 38 and 39.

In addition, these corners portions are also insulated from the hot food entree 12 by virtue of the insulative air space which is present between the opposing walls of the bottom panel 33. More particularly, this insulated area is located between the central portions 34 and 35 and between the intermediate portions 36 and 37, which area continues through to the fully sealed corner portions 38, 39 at which the package is most conveniently grasped in order to pour out the contents as illustrated in FIG. 3.

In order to better understand the construction of the bottom portion of the pouch 11, reference is made to FIG. 7, which shows the pouch in a configuration at which the air space between the opposing portions of the bottom panel is reduced to the extent that same can be in contact with each other when all of the food entree has been squeezed out of the unsealed portion 41 of the bottom of the pouch, the uppermost portion of which is designated by phantom line 42 in FIG. 3 and FIG. 7. This shows the collapsed orientation of the bottom portion of the flexible pouch. Phantom line 43 in FIG. 7 illustrates the sealed area which is below unsealed portion 41 in this central portion of the pouch. In this drawing, the lips 51 contact each other because the gusset of the pouch is collapsed.

When the pouch is in its stand-up or upstanding configuration and expanded-bottom orientation as shown in FIG. 4, the sealed handle projection 26 defines a peripheral skirt 44. More specifically, the peripheral skirt 44 is defined by the seal between the side panels

13 and 14 and a portion of the bottom panel 33. This peripheral skirt portion defines a bottom panel peripheral edge 45, which is the portion of the pouch that engages the support surface, such as a horizontal surface within a microwave oven (not shown). Thus, the flexible pouch 11 will stand up when this skirt bottom edge 45 engages the support surface. The result is an upstanding flexible pouch having a vertical cross-section which is substantially triangular as generally shown in FIG. 4.

It will be noted that, in the preferred gusset arrangement which is shown, the lips 51 and diagonal seal interfaces 52 meet at generally angular seal intersections 53 and 54. This facilitates a positive and distinct opening of the bottom gusset, such as when the pouch is filled. The relatively sharp intersections 53 and 54 focus the energy of gusset opening action at four point-like locations so that the energy concentrates toward those locations to more rapidly "pop" open the four gusset corners. This energy focus is also believed to help to more fully open these corners of the gusset which provide an open gusset that has the structurally supportive advantage of sharp corners that tend to keep the gusset open, and the pouch erect, once the gusset has been opened.

With further reference to the food entree 12, a premeasured quantity of food entree is hermetically sealed within the flexible pouch in order to provide a combination sealed flexible pouch and food entree. The food entree is of a type which is refrigerated until heated for use and serving. Because they are pasteurized and refrigerated, rather than retorted for example, the entrees not only have a longer shelf life, they are also of high product quality because they are not subjected to elevated temperatures in excess of pasteurization temperatures, which are relatively mild.

Preferred entrees are those which include substantial quantities of protein material such as vegetables, meat, poultry, fish and the like. Protein sources 46 are illustrated in the drawings. It is generally preferred that a sauce 47 is combined with the protein source 46 in order to provide a seasoned meal component or entree which is suitable for combining with desired materials (not shown), such as baked dough materials including breads, buns, bagels, chips, tortillas, and the like. Exemplary meal entrees are barbecue beef, barbecue chicken, southwestern chicken, sloppy joe, ham and cheese, turkey and gravy, lemon herb chicken, and the like. It is preferred that the meat component be low in fat so as to provide a food entree which is not a substantial source of fat.

It is typically preferred that the pouch contain printed indicia which will provide the required packaging and labeling information, instructions for use, promotional material, and the like. In this instance, it is preferred that the pouch include a transparent area or window through which the consumer can view the food entree prior to, during and after heating. An exemplary window in this regard is designated at 48 in FIG. 1. Printed indicia can be printed onto the remainder of the flexible pouch

It will be appreciated that the fully sealed grasping areas 18 and 19 and the fully sealed grasping corner portions 38 and 39 each have a surface area size which is adequate for digital or finger grasping to facilitate opening and pouring of the hot food entree out of the flexible pouch. Exemplary dimensions in this regard include the following. A preferred minimum depth of each of these areas is about 0.75 inch or about 2 cm from the top or bottom edge of the pouch to the area of the pouch within which a food entree is contained. Greater widths are also possible where additional materials can be afforded, whether in terms of cost, conservation of materials and/or available space. In addition, the top edge portion may include a hole 49 by which the pouch and entree combination can be suspended such as from a peg or rod during display within a retail store refrigerated case.

Referring more specifically to the polymer sheeting from which the pouch is constructed, same is preferably a gas barrier film. Often, a preferred manner of achieving the desired oxygen barrier properties while still exhibiting adequate heat sealing properties is to provide paneling or sheeting which is laminated or coextruded. A particularly advantageous combination is a laminate which includes an outer material for toughness, an inside material for superior heat sealing properties, and an intermediate material which enhances the gas barrier properties of the laminate. A suitable outer material is an oriented polyester such as oriented or biaxially oriented polyethylene terephthalate. A typical inner layer is a polyolefin such as a polyethylene or a polypropylene, for example linear low-density polyethylene. A typical internal or intermediate gas barrier layer is a vinyl polymer such as ethylene vinyl alcohol. Such a laminated or coextruded film is flexible and can have a thickness of on the order of about 4 mils (0.102 mm). A second intermediate oriented polypropylene layer can also be included to enhance toughness during pasteurization and often also to improve appearance after pasteurization.

With reference to the procedure or method in accordance with the invention, film or sheeting such as that described above, which may be preprinted and include one or more windows as desired, is formed into the pouch as discussed herein. Such can be accomplished with the assistance of commercially available equipment such as Klöckner-Bartlet rotary form/fill/seal pouch packaging machinery. In such an arrangement, all seals except for the top seal are made, with the open top forming a mouth. The food entree is inserted through the mouth in order to generally fill the open flexible pouch. Next, the pouch is flushed with gas absent of oxygen (such as nitrogen gas), and the top edge is sealed so that the chosen portion of food entree is fully sealed within the sheeting of the pouch.

Thereafter, these filled pouches are conveyed to pasteurizing equipment wherein they are heated to an internal temperature of approximately 165° F. (about

74° C.). Once suitably pasteurized, the combination of pouch and food entree is cooled to refrigeration temperatures, such as on the order of 40° F. (about 4.5° C.), the temperature being a non-freezing temperature, that is being above 32° F. (0° C.). The temperature is also adequate to properly store the pasteurized food entree for extended time periods of several weeks. Thereafter, the combination is ready for commercial storage, distribution and retail display, followed by a reasonable period of home storage, all under refrigerated conditions.

At the appropriate time, the consumer grasps the top edge, particularly at the sealed grasping area 18 or 19, this being done with one hand, while the other hand grasps a portion closely spaced therefrom along one of the side seals. Then, typically with the assistance of a notch, all or a portion of the top portion is torn away from the rest of the pouch, thereby opening the pouch. Next, the consumer places the pouch and entree combination into a microwave oven or the like and heats same to an appropriate post-pasteurization and serving temperature. A suitable internal temperature in this regard is as low as about 140° F. (60° C.), often between about 160 and about 170° F. (about 71 to about 77° C.). The heated food is removed from the pouch, such as by pouring the food entree through the thus-opened top of the pouch. This pouring can be facilitated by grasping the pouch at one of the corner portions of the handle projection or skirt at the bottom portion of the pouch.

It will be understood that the embodiments of the present invention which have been described are illustrative of some of the applications of the principles of the present invention. Numerous modifications may be made by those skilled in the art without departing from the true spirit and scope of the invention.

Claims

1. A combination of an upstanding flexible pouch (11) and a food entree (12) contained within the flexible pouch (11), comprising:

a flexible pouch (11) having a pair of opposing side panels (13, 14), each said side panel having opposing side edges, a top edge (15, 16) and a bottom edge portion (31, 32);
said flexible pouch further having a bottom panel (33) with a peripheral edge;
said opposing side edges of one of said side panels (13) being sealed to said opposing side edges of the other of said side panels (14) to provide a pair of side seals (21, 22), said top edge (15) of said one of said side panels (13) being sealed to said top edge (16) of said other of said side panels (14) to provide a top seal (17), and said bottom edge portion (31) of said one of the side panels (13) and said bottom edge portion (32) of the other of said side panels (14) both being sealed to a portion (34, 35) of said bottom panel (33) which includes said peripheral edge portion thereof to provide a bottom seal, and said side panels (13, 14), bottom panel, side seals (21, 22), top seal (17) and bottom seal combining to form said flexible pouch (11);
said bottom panel (33) having an internal portion (36, 37) thereof which is not included in said bottom seal, said internal portion (36, 37) of the bottom panel (33) being foldable onto itself to define an unexpanded bottom end orientation of said pouch, said internal portion (36, 37) also being unfoldable to define an expanded orientation of the bottom portion of the flexible pouch (11), and said bottom seal defining a skirt (44) which has a bottom peripheral edge (45) for engaging a support surface whereby said flexible pouch (11) in its expanded orientation stands up when said skirt bottom edge (45) engages the support surface to provide an upstanding flexible pouch (11);
said flexible pouch (11) having a vertical cross-section which is substantially triangular when the pouch is at its expanded orientation with the unsealed portion of the bottom panel (33) forming a base of the triangle; and
a premeasured quantity of a food entree (12) sealed within said flexible pouch (11) to provide a combination sealed flexible pouch and food entree, said combination being refrigerated and being suitable for microwave heating.

2. A combination according to claim 1, wherein said top seal (17) further includes a tear component (23, 24) by which said top seal (17) can be torn away in order to gain access to the food entree (12) sealed within the flexible pouch (11).
3. A combination according to claim 2, wherein said tear component (23, 24) is along at least one of said side seals (21, 22), and wherein at least one of said side seals (21, 22) has a surface adjacent to said tear seal (18, 19) and of a size adequate for digital grasping to facilitate opening of the heated flexible pouch (11) by tearing along said tear component (23, 24).
4. A combination according to any one of claims 1 to 3, wherein at least one of said side panels (13, 14) includes a transparent window area (48) through which said food entree (12) is visible from outside of the flexible pouch (11), the side panels (13, 14) being otherwise non-transparent.
5. A combination according to any one of claims 1 to 4, wherein said bottom seal has at least one portion (38, 39) which has a surface area of a size adequate

for digital grasping to facilitate pouring of the food entree (12) out of the flexible pouch (11) when said flexible pouch (11) is heated and opened by removing at least a portion of said top seal (17).

6. A combination according to any one of claims 1 to 5, wherein said food entree (12) is pasteurized within said sealed flexible pouch (11) prior to its being a refrigerated combination.
7. A combination according to any one of claims 1 to 6, wherein said side panels (13, 14) and bottom panel (33) are polymer sheeting laminates.
8. A combination according to any one of claims 1 to 7, wherein said side panels (13, 14) and bottom panel (33) are formed from a single piece of sheeting.
9. A combination according to any one of claims 1 to 7, wherein said side panels (13, 14) and said bottom panel (33) are each formed from a separate piece of polymer sheeting.
10. A combination according to any one of claims 1 to 9, further including a hole (49) through said side panels (13, 14) at a location no lower than said top seal (17).
11. A combination according to any one of claims 1 to 10, wherein said food entree (12) includes a protein source and a sauce.
12. A combination according to any one of claims 1 to 11, wherein said food entree (12) includes a protein source selected from meat, poultry and fish.
13. A method of providing a hot food entree (12), comprising the steps of:
 - providing an open flexible pouch (11) having a pair of opposing side panels (13, 14) and a bottom panel (33) sealed together along all but a top edge at which the side panels are in directly opposing relationship in order to define a mouth (25) of the pouch (11), said open flexible pouch (11) having a bottom seal including a skirt (44) which has a bottom edge (45) for engaging support surface when the pouch (11) is in an expanded configuration, the skirt (44) generally surrounding an unsealed internal portion (36, 37) of the bottom panel (33);
 - inserting a food entree (12) through the mouth (25) of the open pouch (11) in order to generally fill the open flexible pouch (11);
 - sealing a top portion (15) of one side panel (13) to a top portion (16) of the opposing side panel (14) to thereby close said mouth (25) and seal

said food entree (12) within the thus closed flexible pouch (11);
 pasteurizing the closed flexible pouch (11) and food entree (12) sealed therewithin;
 refrigerating the thus pasteurized closed flexible pouch and food entree combination (11, 12);
 distributing the refrigerated flexible pouch and food entree combination (11, 12), said distributing step being under refrigeration;
 opening the panel top edge portion that had been sealed;
 heating the refrigerated flexible pouch and food entree combination (11, 12) within a microwave heating device, said heating being up to human consumption temperature; and
 removing the heated food entree (12) from the flexible pouch (11) through the thus opened top portion of the pouch (11).

14. A method according to claim 13, wherein said opening step includes digital grasping of a side seal (21, 22) and tearing the top edge portion to remove at least a portion of the top seal (17) and thereby open the pouch (11).
15. A method according to claim 13 or claim 14, wherein said removing step includes digital grasping of a portion (38, 39) of the skirt (44) while the entree (12) remains heated in order to thereby pour the food entree (12) out of the opened pouch (11).
16. A method according to any one of claims 13 to 15, wherein said heating step includes positioning the flexible pouch and food entree combination (11, 12) such that the bottom edge (45) of the skirt (44) engages a support surface while the pouch (11) is in its expanded orientation, with the result that the pouch (11) is in a stand-up orientation during the heating step.
17. A method according to any one of claims 13 to 16, wherein said providing step includes providing a hole (49) through a portion of the side panels (13, 14) which is no lower than the top seal (17), and said distributing step includes hanging the sealed flexible pouch and food entree combination (11, 12) from a support peg within a refrigerated display case.
18. A method according to any one of claims 13 to 17, wherein said food entree includes a protein source and a sauce.
19. A method according to any one of claims 13 to 18, wherein said food entree (12) of the inserting step includes a protein source selected from meat, poultry and fish.

20. A method according to any one of claims 13 to 19, further including gas flushing the interior of the flexible pouch (11) between said inserting step and said sealing step.

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FIG. 1

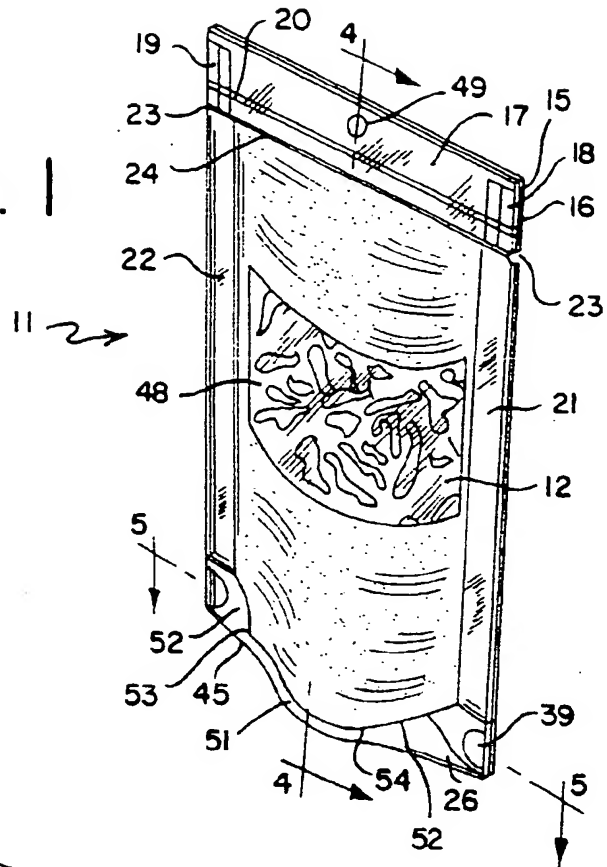


FIG. 2

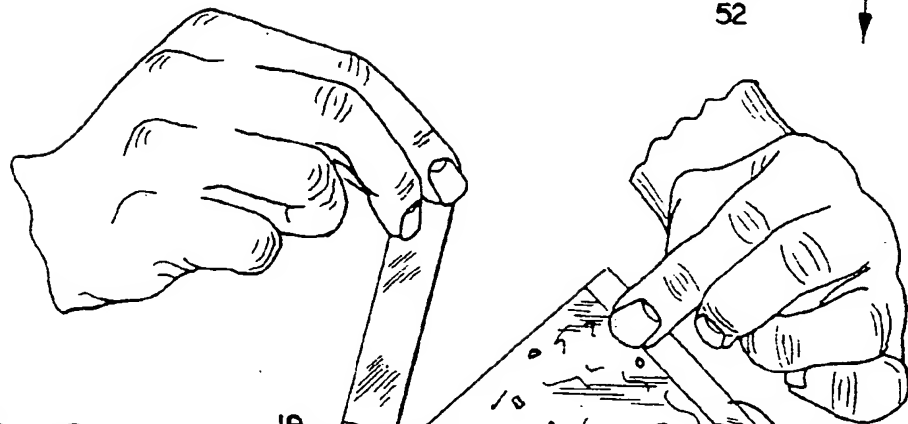


FIG. 6

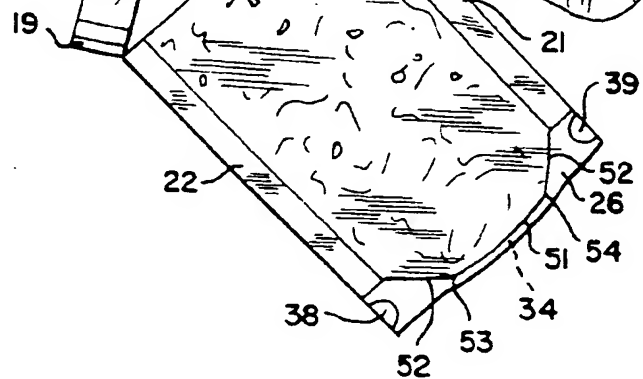
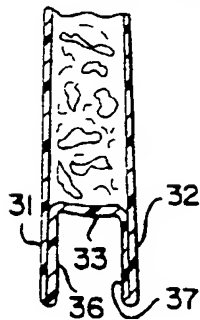


FIG. 4

FIG. 3

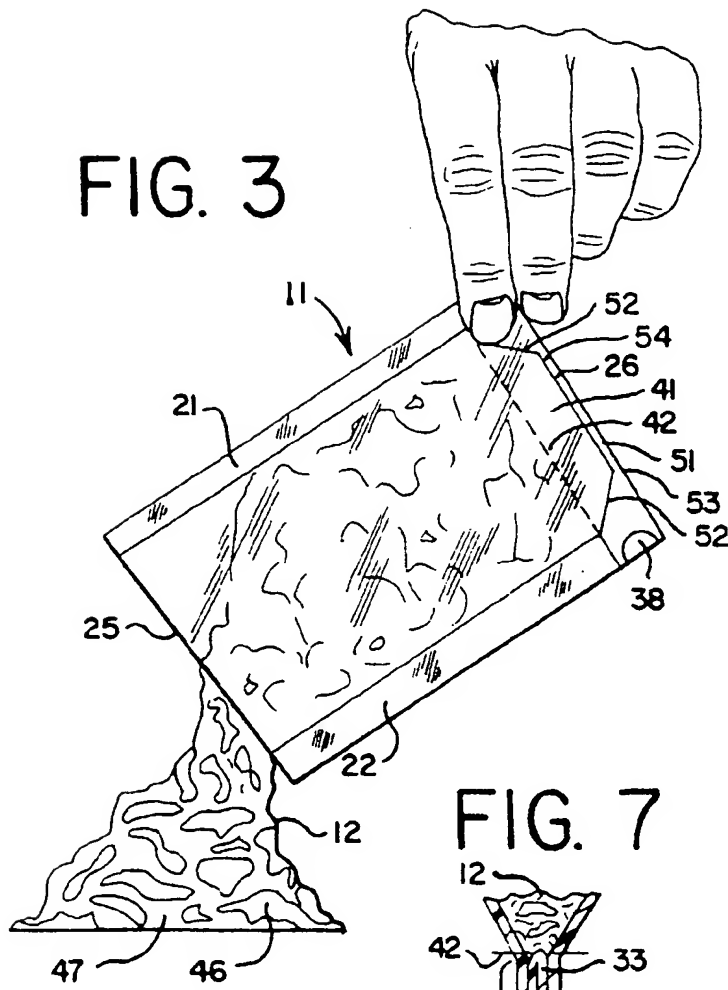


FIG. 7

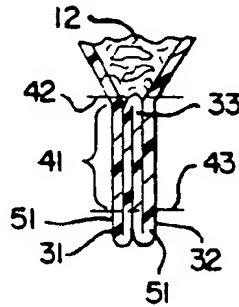
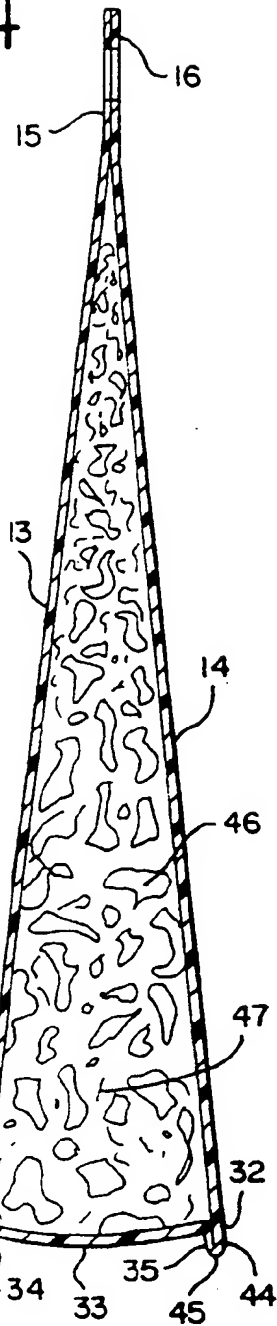
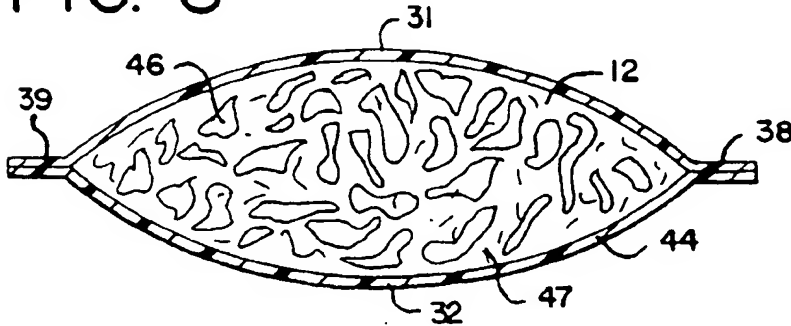


FIG. 5





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 97 30 5847

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 4 837 849 A (ERICKSON LAURENCE R ET AL) * the whole document *	1,5,7,8	B65D81/34 B65D75/00
Y	---	2-4, 10-13, 18-20	
Y	US 5 059 036 A (RICHISON CECIL ET AL) * figures 3-5,11 *	2,3,14, 15	
A	---	1,5,7	
Y	FR 2 718 717 A (CAPY GILBERT ;BUCHBERG AKIVA) * claim 5; figures *	4	
A	---	1	
Y	DE 88 08 158 U (HOECHST) * figure *	10,17	
A	---	1,13	
Y	US 4 806 371 A (MENDENHALL ABRAHAM H) * column 1, paragraph 1 * * column 1, line 48 - line 54 * * column 3, line 59 - column 6, line 22 *	11,12,16	TECHNICAL FIELDS SEARCHED (Int.Cl.6) B65D A23L
A	---	1,13	
Y	US 4 597 974 A (FONTENEAU JEAN L ET AL) * the whole document, especially figure 3 *	13-20	
X	EP 0 223 253 A (TOYO ALUMINIUM KK) * page 1, paragraph 1 * * page 11, line 13 * * page 17, line 2; figures 13A-15 *	1,5,7,9	
The present search report has been drawn up for all claims			
Place of search BERLIN		Date of completion of the search 19 November 1997	Examiner Spettel, J
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